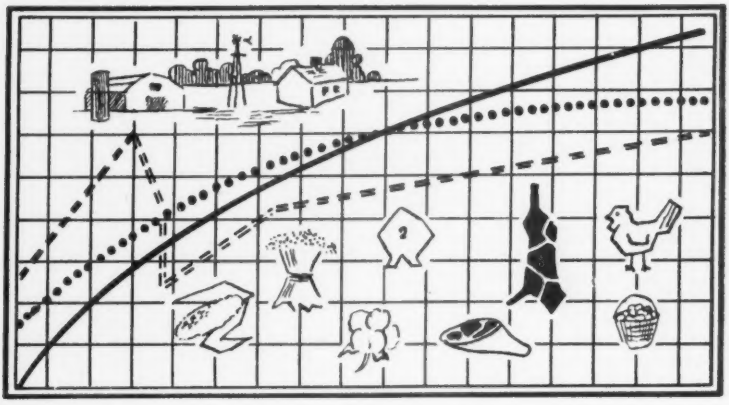
Oklahoma Current Farm Economics



SPECIAL REPORTS

Economic Growth and Agriculture

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The Long-Term Price and Production Outlook For Pecans in the United States

Price Elasticity of Fluid Milk Supply in Eleven Federal Markets

September, 1960

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DIVISION OF AGRICULTURE

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Economic Growth And Agriculture

Leonard F. Miller*

There is widespread and general agreement in this country on the importance of economic growth. It is a major plank in both political platforms, with the only issue being how it should best be achieved.

What do we mean by economic growth? We do not mean simply more total production or income, because we are concerned with the living standard of the individual. Therefore, economic growth means growth in the individual's disposable income expressed in *constant dollars* so that he may buy more goods and services and thus enjoy a higher standard of living. Higher income due simply to inflation is not economic growth. (See Figure 1 for a picture of past growth.) This means our total production of goods and services must rise faster than our population if each of us is to have more goods to enjoy. Basically, economic growth means increasing our ability to produce more per hour of labor. There is no magic by which we can enjoy more goods and services unless we produce more. While economic growth is essential to our personal well being, we must never lose sight of the fact that economic growth and development are the very foundation of our ability to survive as a free, democratic nation in a world that is being challenged by Communism on every front.

Although economic growth is of extreme importance, we should recognize two important facts at the outset:

1. Economic growth is absolutely dependent on world peace and vice versa. All our hopes would vanish in a nuclear war.

2. Economic growth does not automatically mean we will all enjoy the Good Life because this depends also on important non-material

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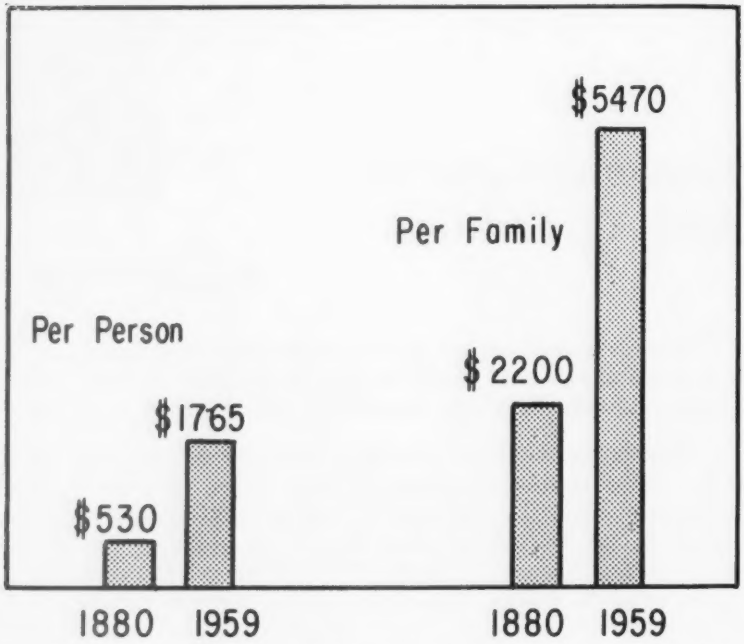


Source: Adapted from Economic Growth in the United States CED Report February, 1958, using 1956 Consumer Prices.

Figure 1—Changes in Disposable Income per Person and per Family From 1880 to 1959 in Constant Dollars.

and spiritual values. But Economic growth provides more opportunity for developing the non-material values we all wish for ourselves and our fellow citizens.

The widespread and increasing use of capital is one of the reasons for our rapid economic growth. In farming, for example, the average investment per worker has increased from around $7,300 in 1940 to $14,300 in 1959, with both figures expressed in 1947-49 dollars. Other factors include (a) our native natural and human resources, (b) the profit incentive under a system of private enterprise, (c) our system of public education, and (d) the stress we place on science and the widespread use of improved technology. Some studies have shown that improving technology has accounted for about 90 percent of our national growth in output per man hour compared with 10 percent for in-

creased capital.[1] We need to keep these factors in mind as we appraise new proposals for promoting future economic growth.

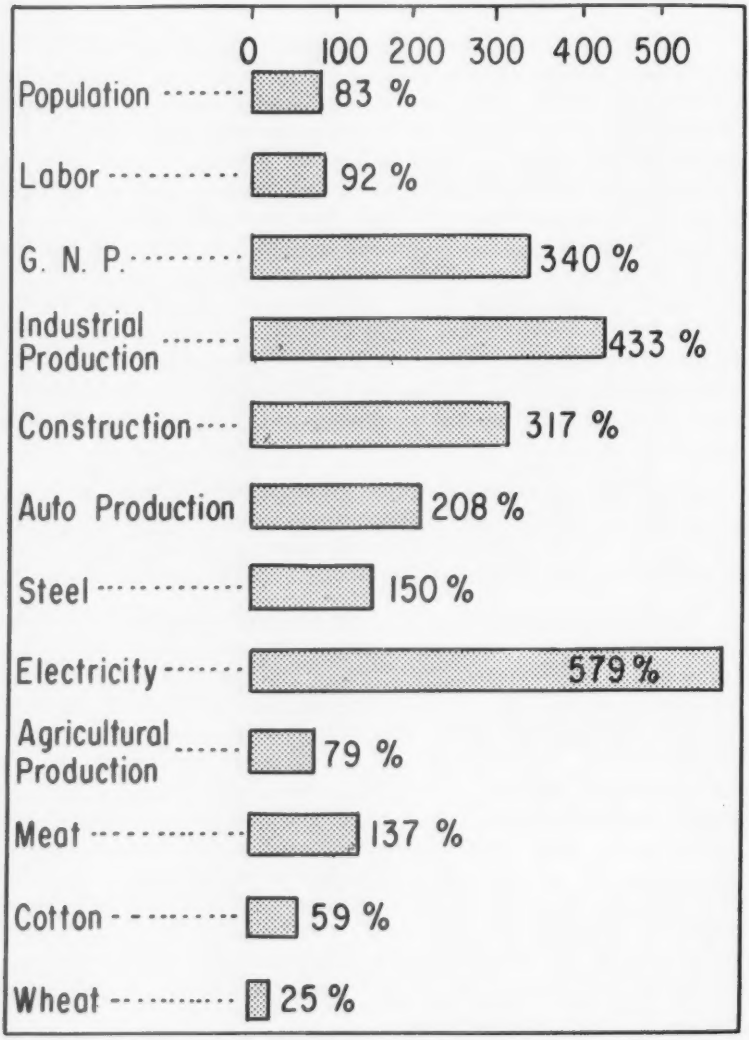
If consumers' desires for different types of goods and services expanded at the same rate as the rise in their incomes in a growing economy, we could avoid many of our serious economic adjustment problems. But this is clearly not the case. As our income rises we may spend very little more for food or fuel for heating, but we may add a second automobile, take an extended vacation trip, send our children to college, or air condition our home. The important point is that not all industries will expand at the same annual rate. Some will grow at ten or twenty percent, while others will grow at only one or two percent, and some will actually decline as new products take over the market. Likewise, the rate of growth probably will continue to vary widely among different areas of the United States. The Rural Development and other suggested programs for depressed areas are recognition of the fact that adjustment problems are more acute in certain areas as well as in certain industries.

Some of the variation in future growth among different sectors of the economy is clearly indicated in the long-range projections for our economy to the year 2000, or about 40 years in the future as reported in the 1959 Annual Report of Resources for the Future (see Figure 2).

Since in a growing economy most industries become larger, some persons erroneously assume we will not face any serious adjustment problems in our economy. This is clearly not the case, however, for if we do produce more per hour, as we must, but find that our market is the type that explands slowly, we find ourselves with some industries having too many workers and perhaps too much investment. This is the position of farming today. Thanks to research, education, and greatly improved machinery, methods, and management, total output and output per man hour in agriculture has been increasing faster than the total market for food which is basically set by the population growth of a little less than two percent annually. The result has been strong downward pressure on prices received by farmers, while the cost of things farmers buy has remained high as they compete with other consumers and producers in the economy for goods to use in production and and in the home (see Figure 3).

Continued advances in agricultural efficiency are necessary for our future economic growth. Only by getting more done per hour of labor are we able to meet our basic needs with fewer workers. This in

[1]*Business Week*, August 6, 1960, p. 68.



Source: Resources for the Future, Inc. Annual Report 1959 pp 72-73.

Figure 2—Projected Growth of the United States 1960 to 2000 a.d.

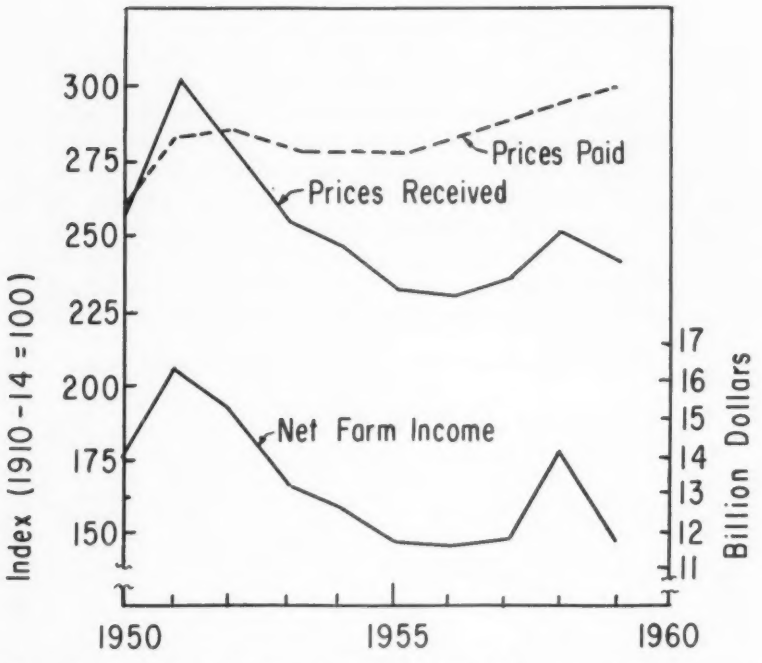


Figure 3—Trend in Prices Received and Paid by Farmers and Net Income.

turn releases the manpower necessary to produce the new goods and services that result in a rising standard of living. As we are able to meet our basic needs for food, clothing and the like with fewer workers, the economy has the workers to produce the pleasure boats, hi-fi sets, or higher education which we associate with economic growth and a higher standard of living.

Since economic growth is severely limited as long as a major part of the population is required to spend its time producing the necessities of life, underdeveloped countries around the world are giving major emphasis to improving the efficiency of food and fiber production. In this world-wide drive to raise living standards, American agricultural "know-how" is destined to make a vital contribution. Our forefathers showed unusual vision in spending public funds to establish a national system of land grant institutions and a U.S. Department of Agriculture devoted to improving agricultural efficiency. Fortunately, the system was successful beyond anything imagined possible.

The widespread improvement in agricultural efficiency has done just what was required for economic growth—released workers for other industries (see Figure 4). From 1950 to 1959 the average annual net loss in farm population was about 800,000. Or put the other way, if we were farming now at the 1950 level of efficiency, we would need about 4.8 million more workers in farming to feed our population. At the 1940 level we would require about 9.2 million more workers. This is a major contribution of the research and educational efforts of our land grant colleges and the U.S. Department of Agriculture—a contribution to economic growth and to society. Unfortunately, this outstanding contribution in the public interest is not generally understood or appreciated.

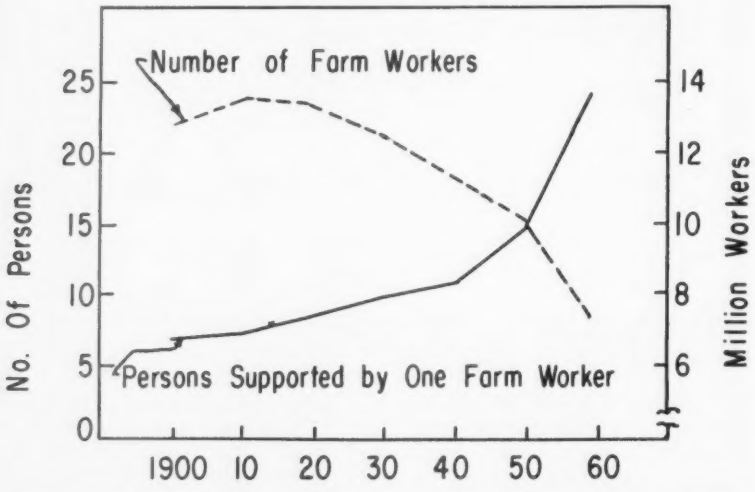


Figure 4—Trend in Total Number of Farm Workers and Persons Supported Per Worker.

But this releasing of workers is not automatic nor without serious problems of personal, family, and community adjustment. It is not easy for anyone to leave his chosen occupation and start in a new field, or to leave a community to which the family has many attachments. This is part of the price that must be paid if we are to have a growing economy. Should those caught in the path of progress bear all the cost of adjustment? What should and can society do to assist in this adjustment process?

It is questionable whether this adjustment to fewer farm families will eliminate the squeeze on their incomes because of basic differences

in the competitive structure of agriculture compared with other major sectors of the economy. This is another story, however, and any change toward more economic bargaining power for farm people will not lessen the need for continued strong efforts to improve efficiency in agricultural production and marketing, and at the same time, to assist those who are not needed in farming to adjust to other occupations. This is especially true in Oklahoma where the state's share of total U. S. farm production has been declining and where there are many families who have limited opportunities in farming because of inadequate resources.

Expansion of Domestic Demand

George S. Abshier*

Expansion of demand, or increased food consumption, is one of the most commonly proposed solutions to the farm problem. Proponents of this idea say that increased consumption will sell more farm products, reduce surpluses, and upgrade the diets of consumers.

Some people say that the rapidly increasing population will eventually result in our eating our way out of the surplus dilemma and even into a shortage. If we compare the current rate of U.S. population increase with the rate of increase in agricultural production, however, it appears that production will outrun population for some time.

What Do We Mean—Expand Demand?

Expanding demand means an increase in the consumption of food at a given price level, and this may involve an increased employment of farm resources—land, labor, or capital.

Selling more of a product at a lower price is not necessarily an increase in demand unless total value is increased.

Temporary increases in supplies during seasonal peaks or high production years usually sell at lower prices, but the demand is not necessarily changed. Furthermore, increased expenditures at the consumer level in the form of payment for increased marketing services do not necessarily mean increased demand at the farm level.

Some Notes to Keep in Mind On Demand Expansion

Population is increasing at a rapid rate, resulting in a rising total demand for most products.

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Annual per capita consumption of food in the United States has remained quite close to 1,500 pounds since World War I. This means that the capacity of the human stomach is no greater now than it was 50 years ago.

Since capacity to eat does not depend on income, consumers in this country with low incomes eat about the same number of pounds as high-income consumers, but the food-mix is different. Per capita consumption has remained relatively stable during this recent period of larger incomes, better foods, food fads, changes in diet, and promotion and advertising.

People want to consume relatively fixed amounts of food products. Once they consume so much, they will buy additional amounts only at a greatly reduced price. Reaction varies with different products.

One dash of salt may be desirable on the breakfast eggs. More than one would not likely be used if salt were free. Therefore, the demand for salt is said to be inelastic to price change.

The demand for bread is also relatively inelastic. A price change of 1 cent per loaf (five percent) changes the consumption very little.

On the other hand, a five percent change in the price of milk or steaks changes the consumption somewhat more than for salt or bread, but less than the five percent price change.

Since the total demand for food is relatively fixed, it takes drastic price reduction to increase consumption.

On the other hand, slightly decreased supplies of some commodities result in greatly increased prices. For example, consumers in the United States want about 350 million bushels of potatoes per year. A reduction in supply of 10 percent results in a much greater price increase. It may be as much as 100 percent. Likewise, an increase in supply of 10 percent results in drastic price decline.

Agricultural products are also said to have a low income elasticity of demand. A 10 percent increase in income is associated with an increase of only about 2½ percent in per capita food consumption. An increase in consumption resulting from increased income may be in terms of increased expenditures rather than volume. In other words, as incomes go up, consumers may move into higher quality products, and they may also spend more for services in connection with the products.

Although per capita consumption has been fairly stable, there have been drastic changes in the consumption of individual commodities. In recent years, there has been an increase in consumption of meats, poultry, eggs, fruits, and vegtables and a decrease in the consumption of potatoes, cereals, sugar, and milk fat. Fewer calories have been consumed, but the total pounds of food per person has remained the same. Decline of caloric intake is generally associated with shorter working hours and less strenuous work. The population increase is about offset by this decline in caloric intake.

Most Americans obtain at least as much food energy from their diets as they need. Therefore, the opportunity for expanding demand lies primarily in the direction of substituting high-value food, measured in terms of resources used, for those of low value. For example, consumption of livestock products requires five to ten times as many farm resources as consumption of basic cereal products. Recent trends in our eating habits show consumers are changing toward these high-quality food products that use more farm resources.

It might be noted that some of these increases in consumption have been associated with relative price declines. This does not necessarily mean a change in demand. It may even result in a decrease in total farm income.

How Can Demand Be Expanded?

Lots of ideas for expanding demand have been tried and still more proposed. Only a few of these proposals will be discussed here.

Promotion and Advertising

Over 1,100 groups in the United States were engaged in promotion of agricultural products in 1958 and 1959. They spent about $67 million during 1958 (see Table 1).

In addition to the money spent by these groups, it is estimated that roughly 20 percent of the $10 billion spent on all advertising is directed to the promotion of food and food products.

The effectiveness of promotional and advertising programs for farm commodities is the subject of much debate. Considering the stability of human consumption, it appears that an increase in the consumption of one product occurs at the expense of another product or products. Thus, promotion by one segment of the agricultural industry might re-

Table 1.—1958 U. S. Expenditures for Advertising and Promotion*

Type of Organization	Organizations promoting	Expenditures
	Number	(000)
Voluntary producer-processor groups	345	$25,508
Farmer marketing cooperatives	574	25,149
Commissions, councils, boards, institutes, etc., established under enabling legislation	120	13,961
State departments of agriculture	20	1,385
Others and unidentified	73	594
Total	1,132	$66,597

*Source: U.S.D.A. AMS Marketing Research Report No. 380, "Promotion of Farm Products by Agricultural Groups".

sult in competitive promotion by other segments. The result may be that the net gain may be eliminated or the groups involved may even have less income after promotion costs are deducted.

No precise appraisal of a particular promotion program for farm products can be made here either in terms of expanding demand for that product or expanding total demand sufficiently to justify costs. Certain criteria need to be considered, however:

1. Advertised product must be one that consumers can easily identify and distinguish from others.
2. Advertised product must be of uniform and desirable quality.
3. Product must be such that advertising can convince persons of difference in quality between advertised and unadvertised supplies.
4. Advertising must be backed up by a coordinated program of distribution and favorable display in all stores.
5. Advertising must be concentrated sufficiently to make an impression on consumers.

Giving consideration to the above criteria, it appears that most state and regional advertising of a portion of the total output of farm products would likely have little effect on product or on food demand. Promotion or advertising appears to show greatest potential for specialty products, new products, or new uses or forms of products.

Advertising and "Animal Agriculture"

A current argument for promotion and advertising in changing consumer preference, while at the same time helping relieve the surplus situation, includes the promotion of increased consumption of animal products. Livestock converts five to seven pounds of dry matter in the form of grain and other feed to about one pound of dry matter in the form of meat, milk, and eggs. So more agricultural resources are needed to provide an animal diet than a grain or cereal diet.

With the obvious increase in consumption of animal products in recent years, this trend has been going on. Yet surplus commodities still plague us. In fact, some surpluses are mounting, while meat consumption is increasing.

Food Distribution Programs

Federal assistance for school feeding first became available during the early 1930's. The program was accelerated by enactment of federal legislation in 1935, which made surplus commodities available to schools serving lunches on a non-profit basis. The National School Lunch Act, passed in 1946, placed the program on a permanent basis. According to the legislation, the basic purpose of the School Lunch Act is to safeguard the health and well-being of the nation's children by encouraging them to eat more nutritious foods.

Paralleling this program, a special School Milk Program was authorized in the Agricultural Act of 1954 and recently extended to June 30, 1961, with expanded appropriations. The principal purpose of this program is to increase milk consumption by school children. The Federal Government reimburses the schools participating in the program up to four cents per half pint of additional milk consumed, and up to 3 cents per half pint for those not in the school program.

The School Lunch Program and the School Milk Program have shown significant growth. During 1957, about 10½ million of the 38.2 million children enrolled in schools were included in the School Lunch Program. They were using 1,816 million pounds of food valued at $562 million. It has been estimated that about 20 percent of this food represents increased consumption. So the actual increase would amount to 363 million pounds of food valued at $112 million or roughly 2/10 of one percent of the retail value of all foods and services.

During 1957, about 18 million school children participated in the milk programs and consumed 1.9 billion pounds of milk. In addition

to these school programs, quantities of food are being provided by the U.S. Department of Agriculture to needy people in institutions and to individual needy persons.

These programs have merit primarily in improving diet and dietary habits of some children, as well as in improving nutrition for the other groups affected by the food distribution program. Very little of the food distributed under this program comes from surplus commodities, so the program has a minor effect on the surplus situation. It might have some tendency, however, to prevent further buildup of surpluses of some commodities. The disposition of about two percent of the total milk production through the milk program might be expected to initially strengthen demand. Eventually, improved prices will probably motivate higher output, and the gains will be those realized from increased quantities sold.

Increasing Consumption Through Income and Price Adjustments

One proposal to increase consumption is to raise the incomes of the low-income people. This proposal assumes that the increases in income would result in increased consumption of food products.

Suppose we want to raise by direct subsidy the consumption of people with incomes under $500 a year to equal those with incomes of $500 to $750. Conservative estimates place the cost at $100 per person or a total of $3 billion a year. The expected consumption increase would be about 2.4 percent of the present total. Only part of this increase would be in commodities now in surplus.

Some have suggested increasing consumption by lowering prices. It is estimated that it would take a 20 percent drop in retail prices to increase consumption by 4 percent. This would likely mean a 40 percent drop in farm prices.

Is Demand Expansion The Answer?

None of the various proposals for demand expansion appear to be the complete answer to the problem of surpluses, low farm incomes, or inadequate nutrition. Because of the relative inelasticity of demand to price or income changes, lower net returns would result if prices declined enough to remove the surpluses. The trends in consumption appear to be working against, rather than for, the use of some of our most burdensome surplus commodities.

Promotion in agriculture appears to be only a partial stimulant for some individual commodities.

The food distribution programs have some merit in improving the diets and nutrition of those participating in this program, but have a questionable effect on the removal of the surplus problem.

The shift to an animal product diet appears to be a slow and rather cumbersome process, with some question as to the ultimate effect.

Increasing consumption by income or price adjustment would be extremely costly and result in only small gains.

Efforts to expand domestic demand, therefore, should be looked upon as only a partial solution to the farm income problem, and should be combined with other methods. The benefits to health and nutrition, however, should not be overlooked.

Domestic demand trends appear to be working both for and against Oklahoma farmers.

Beef consumption has been on the increase for several years, with occasional cyclical exemptions. Assuming continued high incomes, this trend is likely to continue. Any efforts to promote further beef consumption and the "animal agriculture" should favor Oklahoma cattlemen.

On the other hand, consumption of wheat products has declined from previous levels, and the prospect of achieving increased consumption appears dim.

The Long-Term Price And Production Outlook For Pecans in the United States

Mark L. Fowler*

Introduction and Objectives

In terms of farm value, the pecan is the most important horticultural crop produced in Oklahoma. Average annual production of all pecans[1] in Oklahoma was 17.3 million pounds during the ten-year period 1950-59, with an average farm value in excess of $4.0 million annually.

Historically, Oklahoma has been one of the leading pecan producing states in the nation, usually exceeded only by Texas and Georgia in the production of all pecans. In recent years, however, production in Oklahoma has failed to keep pace with the rapid expansion in production in the nation at large. Between 1924 and 1954, for example, production of all pecans in the United States increased more than threefold, while production in Oklahoma increased only about 50 percent.

In spite of the fact that production has expanded less rapidly in Oklahoma than in the nation at large, the Oklahoma pecan industry is characterized by two conditions highly favorable for substantial expansion in production in the next ten to twenty years. First, there are large numbers of pecan trees of nonbearing age throughout the native pecan growing area in the state. Second, extension and research specialists estimate that production from trees now of bearing age could be expanded substantially—perhaps doubled—if known and recommended cultural practices were adopted. These two conditions suggest

[1]Pecans are classified into two broad types. *Seedling* or *native* pecans are those produced from unimproved trees. *Improved* pecans are those produced on trees that have been budded, grafted, or top-worked with stock from named varieties of pecans.

*Assistant Professor, Agricultural Economics.

also that this potential increase in production could be obtained with a minimum investment in the development of unimproved groves and the adoption of improved production practices.

Because of the long-term nature of the investment, however, the decision to invest in pecan production must be based on long-range considerations. The profitability of the investment depends to an important extent on the long-term trend in pecan prices. The long-term price outlook depends, in turn, on expected trends in the market demand for and supply of pecans.

In view of these considerations, a research study was undertaken in the Department of Agricultural Economics, Oklahoma Agricultural Experiment Station, to describe and analyze historical trends in demand, supply, and price relationships for pecans and to project the probable future trends in supply and price.

This is a brief report of the results of that research. First, we consider briefly some basic trends affecting the pecan industry since the 1920's, and discuss the factors affecting prices received by farmers for pecans. We will then turn to the future and summarize projections of population growth, national income, and pecan production and prices. Trends in production and prices of all pecans are projected to the year 1975. Since prices received by Oklahoma farmers and the U.S. average farm price for pecans are highly correlated, projections are made for U.S. prices only.

The projections contained herein are not to be viewed as forecasts. They simply indicate the trends in price and production that would be expected if specific assumptions are realized. Clearly, no one can forecast exactly what the supply of pecans will be in the years centering on 1975. Nor can anyone foresee the exact magnitude of overall measures of growth in the total economy such as population and national income that will have an important effect on the demand outlook. Nevertheless, while the outstanding characteristic of the future is that it is uncertain, practical men must and do make decisions the outcome of which is determined only by long-term developments. It is hoped, therefore, that the projections of future demand and supply conditions contained in this report may provide information useful to those interested in the production and marketing of pecans.

Past Trends

Trends in total production of all pecans in the United States and U.S. population since 1919 are shown in Figure 1. The diagram empha-

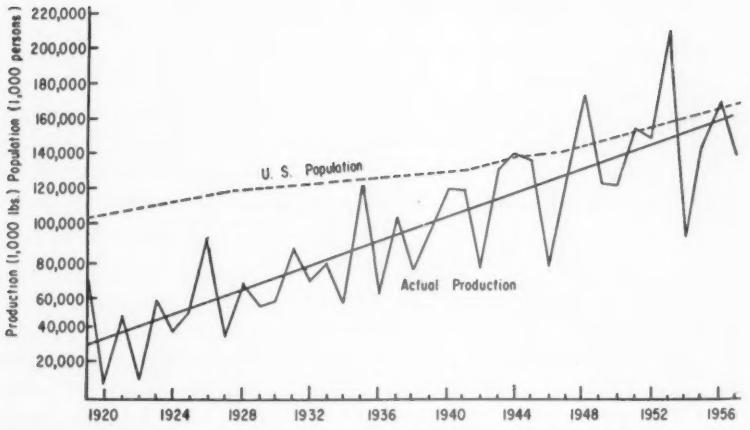


Figure 1—Population and Production of Pecans, United States, 1919-1957.

sizes two facts. First, although production has fluctuated sharply from year to year, the trend in production has been steadily upward. Second, production has increased faster than population. As a result, there has been a pronounced upward trend in production (and consumption) per capita (Figure 2). Over the same period, disposable real income per person in the United States has increased substantially, although at an uneven rate and with brief interruptions.

The relative magnitude of these changes may be illustrated by statistics for two selected periods. Between 1924 and 1954, average annual production of all pecans increased from 45.5 million pounds to 153.6 million pounds (calculated from the trend line), an increase of 238 percent. Over the same period the nation's population increased some 42 percent, from 114 million persons in 1924 to 162 million in 1954. The greater relative growth in production than in population caused per capita production to increase from 0.43 pounds per person in 1924 to about 1.06 pounds per person in 1954 (calculated from the trend line), an increase of 146 percent. At the same time, disposable real income per capita was increasing from $834 in 1924 to $1,378 in 1954, an increase of about 62 percent.

In the absence of counterbalancing forces, the steady and pronounced increase in per capita production since the 1920's would have resulted in increasing downward pressure on pecan prices relative to the general price level. Actually, however, average prices received by growers for

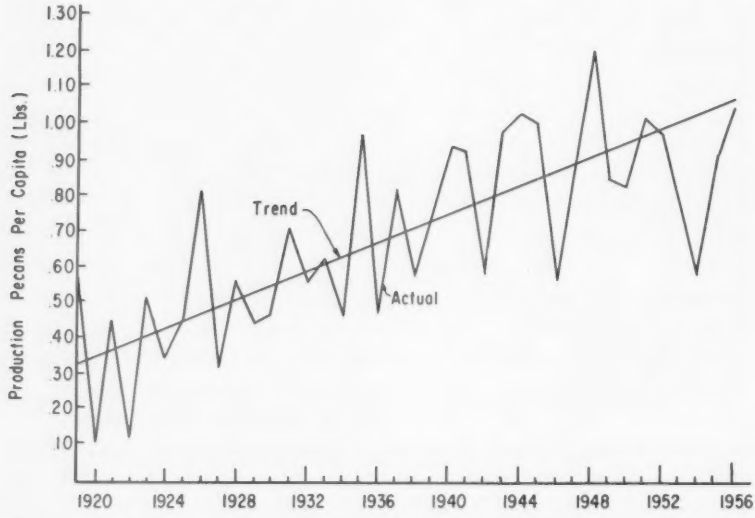


Figure 2—Per Capita Production of All Pecans, United States, 1920-1956.

pecans, after adjustment for changes in the general price level, decreased only moderately (about 10 to 12 percent) between the mid-1920's and the mid-1950's (Figure 3).

Figure 3—United States Farm Price of All Pecans Actual and Deflated by the CPI, 1920-1957.

Factors Affecting Pecan Prices

The question naturally arises as to why has it been possible to sell a continuously increasing per capita supply of pecans during the past 30 years with only a moderate long-term decline in real prices. This is in marked contrast to the experience for many other agricultural commodities which have been plagued with surplus supplies and depressed prices. In other words, what are the major factors that affect the price of pecans?

Pecan prices are determined, of course, by the interaction of the market demand for and supply of pecans. But in order to explain the behavior of prices in the past and to appraise the long-term outlook, demand-supply-price relationships must be measured. Otherwise, the effects of individual demand and supply factors on price cannot be evaluated.

The supply of pecans in any given year consists of production, carryover stocks from previous years, and net imports (which may be negative). Production is the most important component of supply in any year. Imports and exports of pecans are relatively unimportant quantitative components of total supply. Year-to-year changes in the level of carryover stocks have some effect on the supply available in any given year, but do not influence the available supply over a period of several years. Hence, over a period of several years, the supply of pecans consists largely of production.

The demand for pecans is determined by four major factors: (1) population, (2) tastes and preferences of consumers, (3) the level and distribution of consumer income, and (4) the availability or prices of substitute commodities. In a statistical study of pecan prices, the factors found to be of primary importance in explaining variations in annual farm prices for all pecans in the United States were (1) the supply of pecans per capita, (2) disposable national income per capita, and (3) a linear time trend. These factors explained 78 percent of the annual variation in pecan prices.

(The statistical analysis resulted in the following equation: $X_1=2.65-21.64\ X_2+0.54\ X_3-0.60\ X_4$, where X_1 refers to U.S. season average price received by farmers in cents per pound; X_2 refers to U.S. net supply of pecans per capita; X_3 is the index of per capita disposable income (1947-49=100); and X_4 is time in years (1922=1). The analysis was based on annual data for the years 1922-1956, omitting the war years 1942-45. Price and income were deflated by the Consumer's Price

Index to adjust for changes in the purchasing power of the dollar. All the coefficients are significantly different from zero at the one percent probability level.

It was expected that the price of pecans would be affected by the available supplies of other tree nuts. Several analyses, however, failed to yield statistically significant results.)

Based on this analysis, several conclusions can be drawn that have important implications for appraising the future outlook for the pecan industry. They also explain to a large extent the moderate decline in price in the face of substantially larger per capita supplies over the past three decades.

First, the demand for pecans is such that a given percentage change in real disposable income per capita will result in a larger percentage change in consumption in the same direction, with no change in price or other factors affecting demand. In this analysis, the *income elasticity* of demand was estimated to be 2.9.[2] This means that a change of 1.0 percent in disposable real income per capita will result in an increase of 2.9 percent in consumption per capita with no change in price or other factors affecting demand.

Second, a given percentage change in production is associated with a smaller percentage change in price in the opposite direction. In this analysis, a change of 1.0 percent in production was associated with a —0.73 percent change in price.[3]

The analysis also showed that for the years included in the study, the price of pecans decreased an average of 0.6 cents per pound per year with no change in other demand factors. This may well reflect the influence of increased supplies of other domestic and nondomestic type tree nuts. However, increased population and per capita real incomes more than offset the effects of this downward trend in demand.

Although tastes and preferences of consumers could not be taken into account in the statistical study, there is another factor tending to increase the demand for pecans. Major technological advancements have been made in cracking and shelling equipment, in refrigerated storage, and in consumer packaging. This has made it possible to provide consumers, both household and institutional, with a dependable supply of

[2]The *income elasticity* of demand is the percentage change in consumption that occurs in response to a change in income divided by the percentage change in income.

[3]This relationship is called the *price flexibility* and is equal to the percentage change in price divided by the percentage change in production causing the price change. The inverse of the price flexibility provides an estimate of the *price elasticity of demand* of -1.38.

a high-quailty product throughout the year. Undoubtedly, this has tended to increase the demand for pecans by those already using them and to expand the market to consumers who had not previously used pecans to any significant extent. In addition, the National Pecan Shellers and Processors Association and others have carried on educational and promotional work aimed at encouraging the consumption of pecans.

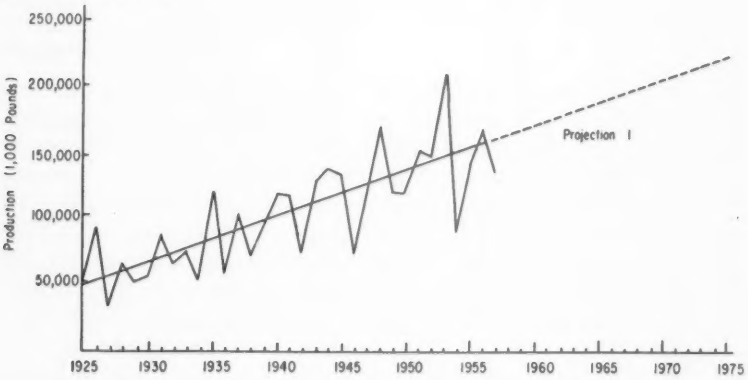
The Outlook for the Future — 1975

What is the price outlook for the future? In order to appraise the probable trend in pecan prices, it is necessary to assess the probable trends in the factors that affect prices. No precise estimates of future trends are possible, but we can make some carefully considered projections that may serve as useful guides to the course of future events.

Projected Production

Figure 4 shows annual production of all pecans for the years 1925 to 1957 and the trend in production projected to 1975. The projection is based on the linear trend in production calculated from annual data for the years 1920-1957.[4] The linear trend seems to be quite reasonable for projection over the relatively short period of 15 years from 1960 to 1975. It results in a projection of total production of 193, 211, and 230 million pounds of pecans in 1965, 1970, and 1975, respectively.

Figure 4—United States Production of All Pecans 1925-1957, with Projections to 1975.



[4]The trend is represented by the equation: $P=27,464+3,605(t)$, where P represents total U.S. production of all pecans (1,000 pounds), and t represents time in years (1920=1).

Projected Population

The U. S. Bureau of the Census makes periodic projections of population based on alternative sets of assumptions regarding birth and death rates and migration. Current estimates of population of 177.1 million for July, 1959 and 179.2 million for January, 1960, indicate that population is now increasing about in line with the census projection that indicates population will be about 193 million in 1965; 209 million in 1970; and 229 million in 1975. These are the estimates used in this study.

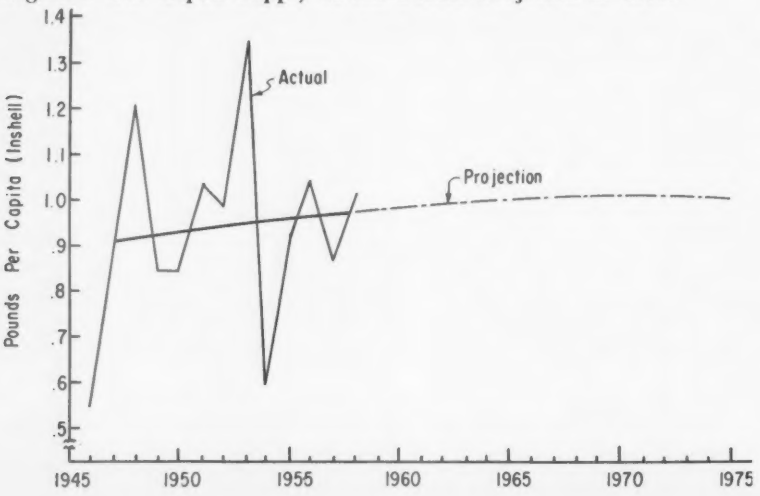
Per Capita Production

Combining the projections of total production and U.S. population, and assuming that net exports from the United States will be about one percent of domestic production (based on experience during the 1950's), we obtain the projection of per capita supply shown in Figure 5. According to these projections, population will increase at a faster rate during the next 15 years than will total production. As a result, the per capita supply will increase very slowly and be about 1.0 pound in 1975.

Disposable Real Income Per Capita

Figure 6 shows the index of U.S. disposable income per capita (1947-49=100) for the postwar years both in current dollars and in

Figure 5—Per Capita Supply of All Pecans Projected to 1975.



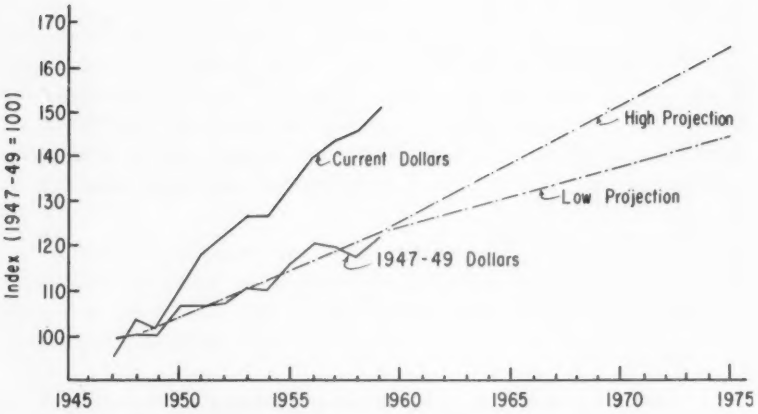


Figure 6—Postwar United States Disposable Income per Capita Projected to 1975 in 1947-49 Dollars.

constant 1947-49 dollars. Two projections of the index of per capita income in terms of the 1947-49 price level are also shown. The high estimate is based on the assumption that the increase in the index of about 1.9 percent per year in the postwar period will continue. The low projection was chosen to arbitrarily reflect an increase in the index of 1.0 percent per year. Thus the index is projected to range between 144 and 165 by 1975 compared with an index of 122 in 1959. This would represent an increase in the index of real per capita income of between 18 and 34 percent between 1959 and 1975.

Projection of Prices

Two projections of pecan prices to 1975 are shown in Figure 7. The projections are in terms of the 1959 price level. They are based on the assumption that the projections of total production, population, and national income summarized above are approximately correct, and that past relationships between demand, supply, and price remain approximately the same until 1975. Projection 1 is based on the assumption that the index of disposable real income per capita increases in line with the high projection in Figure 6, i.e., at about 1.9 percent per year. Projection 2 is based on the low projection of income, i.e., an increase of 1.0 percent per year.

Two points should be emphasized. First, the projections are in terms of the 1959 price level. Any major changes in the general price

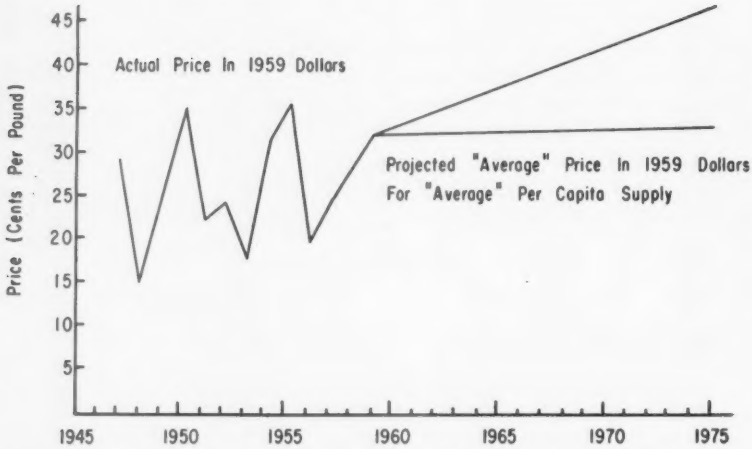


Figure 7—United States Average Farm Price of All Pecans in 1959 Dollars for a Crop of Average Size, Projected to 1975.

level will probably be accompanied by similar changes in actual pecan prices. Sharp inflation or deflation may invalidate this assumption.

Second, the projections are based on *average* per capita supply represented by the projection in Figure 5. Thus, the projections of price represent the long-term trend in the average level of prices. Actual prices in individual years will fluctuate around this average level because of annual fluctuations in actual production, income, net foreign trade, changes in carryover stocks, and perhaps other non-measurable factors.

Evaluation of Projections

Projection 1 reflects a very favorable outlook for pecan prices. In fact, the likelihood of the simultaneous realization of the set of conditions underlying this projection may be small. Hence, projection 1 probably represents the upper boundary of any realistic trend in prices.

There are two reasons for this. First, if pecan prices actually increase in line with projection 1, total production may increase somewhat faster than indicated by the past trend in production. Second, the rate of population growth used in the projections may be too high. If production increases at a faster rate than that indicated, or population should increase at a slower rate than assumed, then per capita supply would be larger than indicated, resulting in a downward pressure on prices.

The only difference in the conditions underlying projections 1 and 2 is that a rate of growth in income of only 1.0 percent per year is assumed for projection 2 while a rate of 1.9 percent per year is assumed for projection 1. Most analysts are now predicting that income will increase at a rate even higher than 1.9 percent per year. Thus, even if per capita supply increases somewhat faster than our projections show, projection 2 may well represent the lower boundary of the trend in future prices.

Based on the above and other subjective considerations, it is believed that the trend in pecan prices is likely to lie somewhere between these two projections, and probably somewhat closer to the high projection than to the low one.

Summary and Conclusions

We have seen that total and per capita production of all pecans have increased substantially over the past 30-40 years with only moderate decreases in real farm prices. Per capita production increased almost 150 percent between 1924 and 1954, while real prices declined only about 10-12 percent. We also found that the major factors affecting farm prices for pecans were total production of pecans, population, and national income.

It was further found that the demand for pecans is elastic with respect to both income and price. These characteristics, combined with the pronounced increase in real per capita incomes over time, largely explain the relatively small long-term decline in price in the face of a steadily increasing per capita supply.

Projections of demand and supply factors to 1975 indicate that increasing population and rising real per capita incomes are likely to more than offset expected increases in total production, resulting in a rising trend in the average level of prices received by growers for pecans.

Price Elasticity of Fluid Milk Supply in Eleven Federal Order Markets

Preston LaFerney*

An analysis of the effects of various pricing and base plans for attaining stable monthly production of fluid milk in Oklahoma is currently in progress at the Oklahoma Agricultural Experiment Station. This report represents one phase of the analysis which involved the determination of the effects of various economic factors on quantities of fluid milk supplied in markets using different types of seasonal pricing plans. The primary concern of this phase was to determine the relationship between Class I price of milk and quantities of fluid milk supplied. A total of 11 Federal Order markets were included in this phase of the study, although some of the analyses were completed only for the Oklahoma Metropolitan Marketing Area.[1] This area consists primarily of central and northeastern Oklahoma and includes the major cities of Oklahoma City, Norman, Shawnee, Guthrie, Stillwater, Ponca City, Cushing, Tulsa, Muskogee, Tahlequah, and McAlester.

Selection of Relevant Variables

Preliminary investigation was made of the Oklahoma Metropolitan market in order to determine which factors were most likely to have a significant effect on quantities of milk supplied. Simple correlation co-

[1]The 11 markets included Central West Texas, Chicago, Ft. Smith, Kansas City, Louisville, Neosho Valley, New Orleans, North Texas, Oklahoma Metropolitan, St. Louis, and Wichita Federal Order markets.

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efficients were calculated to determine the relation between daily average delivery of milk per producer and the following factors:[2] (1) Class I price of milk, (2) index of prices of meat animals, (3) index of prices of crops, (4) hourly wage rates paid hired labor, (5) time, (6) index of prices of cattle and calves, (7) total cost of fluid milk production per hundredweight in western Wisconsin,[3] and (8) daily average delivery of milk per producer in the previous year. Annual data were used for years 1950 through 1959 and the Oklahoma prices were deflated by the index of prices received by Oklahoma farmers for all commodities. The correlation coefficients are listed in Table 1.

Wage rates and time were highly correlated with the quantity supplied the previous year. The correlation coefficients were 0.922 and 0.988, respectively. Meat animal prices were also highly correlated with cattle and calf prices ($r = 0.838$). In addition there was a strong positive relationship between total cost of milk production and quantity supplied ($r = 0.869$). For these reasons only four of the eight variables listed were selected for use as independent variables in the regression analyses for daily average delivery of milk per producer.

The Results

Three regression analyses were completed for each of the 11 markets in order to determine the best fitting equation for Y, the daily average delivery of milk per producer for each market. In the first analysis, explanatory independent variables included Class I price (X_1), crop prices (X_2), meat animal prices (X'_2), and quantity of milk supplied lagged by one year (X_3). The equations were of the form $Y = a + b_1X_1 + b_2X_2 + b_3X'_2 + b_4X_4$. In these analyses, annual data applicable to each market were used,[4] Prices were deflated by the index of prices received by farmers for all commodities in the respective states.

In general, only the prices of one alternative (either X_2 or X'_2) had a logical sign for the b value (the effect of this alternative on milk production). Therefore the variable with the incorrect sign was rejected and a new regression with only one alternative enterprise was computed. Finally a regression was computed which included only the Class I price and lagged production.

[2]Weighted average deliveries of milk by producers in the Tulsa-Muskogee and the Oklahoma City markets were used for years prior to the 1957 merger of these two markets. The eight factors considered here were assumed initially to be those which had the most effect upon the quantity of milk supplied by dairymen.

[3]Cost of milk production for Oklahoma was not available. Cost of production in western Wisconsin was selected as representative of costs in Oklahoma.

[4]United States prices of crops, meat animals, and all commodities were used for the Louisville market, since none of these prices was available for Kentucky.

Table 1.—Simple Correlation Coefficients, Oklahoma Metropolitan Area.

	Daily Delivery	Class I Price	Meat Animal Prices	Crop Prices	Wage Rates	Time	Cattle & Calf Prices	Total Cost of Production	Daily Delivery (1-Year Lag)
Daily Delivery	1	.524	.129	—.154	.930	.978	.147	.869	.984
Class I Price		1	—.548	.450	.684	.608	—.502	.602	.506
Meat Animal Prices			1	—.890	—.226	0[1]	.995	—.202	.121
Crop Prices				1	.190	—.045	—.862	.175	—.149
Wage Rates					1	.958	—.208	.917	.922
Time						1	.593	.879	.988
Cattle and Calf Prices							1	—.180	.134
Total Cost of Production								1	.838
Daily Delivery (1-Year Lag)									1

[1]Rounded to zero.

From these analyses, one regression equation was selected for each market. The selections were made by observing the b values and their standard errors for the different regression equations derived for each market. Table 2 includes the b values, standard errors, R^2, and elasticity estimate for the equation selected for each market, and the time period covered by the analysis. For example, the equation for the Oklahoma Metropolitan Marketing area was $Y = -75.80 + 63.66X_1 - 72.41X_2 + 1.14X_3$. This equation was computed for the 1950-59 period and explained almost 98 percent of the variation in daily average production per producer over this period for this market.

The Coefficient of Determination, R^2, for each market was high and ranged from 0.847 in Ft. Smith to 0.997 in Central West Texas. However, the size of this coefficient should not be overemphasized. It was largely the result of the very high correlation between daily average production in a given year with daily average production in the previous year. In addition, the number of observations for each market was quite small. The number of degrees of freedom for establishing statistical significance was less than nine for seven of the markets and was as low as four for the Ft. Smith and two for the Central West Texas markets.

Class I price of milk appeared to be an important variable in explaining changes in daily average production per farm. The coefficients were larger than their respective standard errors in all markets but this differential was relatively smallest in the Oklahoma Metropolitan market. Prices of crops were important either directly in the equation or indirectly through an effect on the Class I price for the three markets of Central West Texas, Chicago, and Oklahoma. Prices of meat animals were important in only one market, New Orleans. Lagged daily average production per producer was important in all markets. However, this coefficient was not different from 1.0 in any equation except Central West Texas, the equation was only two degrees of freedom.

It is difficult to compare directly the coefficients for the various markets since both prices and quantities are at different levels in each market. However, the coefficients can be compared if they are expressed in percentage terms or elasticities. For this comparison, price elasticity estimates were computed for mean values of the variables as follows:

$$E = b \left\{ \frac{\text{Average of the Class I prices}}{\text{Average of the daily average production per producer}} \right\}$$

The estimates of price elasticity of supply are shown in the last column of Table 2. They give an indication of the sensitivity of quantity

Table 2.—Selected Statistics for Multiple Regression on Daily Average Production Per Producer in Eleven Federal Order Markets.

Market		Class I Price	Crop Prices	Meat Animal Prices	Lagged Daily Average Production	R^2	Time Period[1]	Price Elasticity Estimate
		X_1	X_2	X'_2	X_3			
Central West Texas	b	197.93	−718.11		1.46**	.997	1953-58	.7407[2]
	s_b	(59.86)	(213.96)		(.11)			
Chicago	b	64.90	−61.48*		1.13**	.988	1947-58	.1994
	s_b	(38.02)	(22.26)		(.06)			
Ft. Smith	b	317.92			.73*	.847	1952-58	1.4921
	s_b	(156.46)			(.17)			
Kansas City	b	80.79*			.99**	.974	1947-58	.3916
	s_b	(30.36)			(.07)			
Louisville	b	154.97**			1.10**	.962	1947-58	.7529
	s_b	(45.45)			(.08)			
Neosho Valley	b	131.27*			.78**	.973	1951-58	.6601
	s_b	(49.45)			(.08)			
New Orleans	b	36.37		−38.28	1.01**	.982	1947-58	.2657
	s_b	(20.73)		(23.78)	(.06)			
North Texas	b	54.18			1.04**	.980	1951-58	.1775
	s_b	(33.94)			(.08)			
Oklahoma Metropolitan	b	63.66	−72.41		1.14**	.975	1950-59	.2897
	s_b	(62.00)	(107.15)		(.10)			
St. Louis	b	61.02**			1.12**	.988	1947-58	.2929
	s_b	(16.83)			(.05)			
Wichita	b	102.90*			1.05**	.983	1947-58	.4699
	s_b	(37.77)			(.07)			

* Significant at the 95 percent confidence level. ** Significant at the 99 percent confidence level.
[1]Inclusive.
[2]This means that for each one percent change in milk price the quantity supplied will change about three-fourths of one percent, etc.

of fluid milk supplied to the Class I price of milk in each market and are interpreted as the effect of a one percent change in price on the quantity supplied (measured at the mean or average values). Above or below average prices or quantities would result in a slightly different estimate for the price elasticity in each market. It is obvious from these estimates that responsiveness of quantity of milk supplied to Class I price varied considerably between the 11 markets. Excluding the Ft. Smith and Central West Texas markets, which had only four and two degrees of freedom, respectively, the supply of milk was relatively most sensitive to price changes in the Louisville and Neosho Valley markets and least sensitive in the Chicago and North Texas markets. The range for these markets was 0.75 down to 0.18.

If the seasonal response to price is similar to the annual response, the price elasticity estimates indicate that some type of seasonal pricing plan for milk could function most effectively in influencing quantity of milk supplied in the Louisville and Neosho Valley markets, somewhat less effectively in the Wichita and Kansas City markets, and even less effectively in the North Texas, Chicago, St. Louis, and Oklahoma Metropolitan markets. Apparently both price and non-price ways of influencing the supply of milk should be tested for the latter markets.

Table 1.—Monthly and Season Average[1] Prices Received by Farmers for Oklahoma Farm Products.
(Dollars)

	Wheat	Corn	Oats	Barley	Rye	Grain Sorghum	All hay	Alfalfa hay	Wild hay	Cotton-lint	Cotton-seed	Soy-beans	Pea-nuts
1958	1.75	1.10	.59	.81	.90	1.66	15.50	18.69	12.97	.314	41.40	1.89	.105
1959**	1.75	1.09	.63	.75	.90	1.55	17.00	23.47	14.37	.289	37.70	1.85	.096
Aug.	1.73	1.20	.64	.77	.87	1.69	15.60	19.60	11.50	.300	41.00	1.89	---
Sept.	1.77	1.05	.64	.78	.95	1.46	16.70	21.10	12.50	.310	38.00	1.77	.100
Oct.	1.81	1.05	.67	.79	.98	1.48	16.90	21.30	12.80	.300	37.00	1.78	.095
Nov.	1.83	1.05	.68	.81	.95	1.50	18.20	22.50	14.00	.280	38.00	1.84	.095
Dec.	1.83	1.05	.69	.82	.94	1.52	20.20	25.80	15.60	.267	38.00	1.85	.095
1960 Jan.	1.83	1.10	.72	.83	.97	1.56	20.20	25.80	15.20	.271	38.00	1.85	.090
Feb.	1.87	1.13	.72	.83	1.00	1.58	21.30	27.00	16.30	.265	38.00	1.83	.090
Mar	1.92	1.13	.72	.83	.99	1.59	24.90	31.00	19.00	.267	38.00	1.83	.090
Apr.	1.91	1.18	.70	.82	.98	1.61	23.50	28.80	18.60	.250	-- --	1.90	.090
May	1.81	1.16	.69	.78	.97	1.58	19.20	22.40	16.00	.284	-- --	1.86	---
June	1.68	1.18	.62	.72	.89	1.56	17.60	21.30	14.00	.300	-- --	1.81	---
July	1.69	1.18	.62	.69	.87	1.57	18.20	22.10	14.60	---	-- --	1.83	---
Aug.	1.72	1.19	.65	.72	.88	1.49	18.60	23.00	14.60	---	-- --	1.82	---

	Cattle	Calves	Sheep	Lambs	Hogs	Wholesale milk	Butter-fat	All chickens	Commercial broilers	Eggs	Turkeys	Wool	Alfalfa seed	Sweet Potatoes
1958	21.50	25.50	7.80	21.00	19.60	4.65	.52	.164	.179	.328	.222	.28	19.00	2.35
1959**	22.20	26.90	7.00	19.20	14.20	4.58	.53	.132	.151	.272	.234	.34	21.00	2.30
Aug	22.60	27.50	6.50	19.60	13.90	4.40	.52	.127	.150	.256	.210	.33*	19.70	2.60
Sept.	22.10	27.00	6.50	18.60	13.40	4.50	.53	.126	.145	.279	.210	.37*	20.00	2.50
Oct.	20.70	25.50	6.80	17.40	12.40	4.75	.55	.122	.135	.297	.210	.35*	19.70	2.20
Nov.	19.20	24.20	6.50	17.00	12.20	4.75	.56	.119	.145	.314	.240	.37*	19.40	2.30
Dec.	18.50	23.00	6.60	16.30	11.60	4.80	.55	.128	.165	.324	.270	.34	19.10	2.20
1960 Jan.	19.10	23.20	6.70	16.80	11.60	4.80	.53	.144	.155	.285	.240	.32*	19.30	2.50
Feb.	19.70	24.00	7.50	17.50	12.30	4.80	.53	.145	.155	.261	.240	.32*	19.80	2.50
Mar.	20.80	24.40	8.00	19.50	14.00	4.85	.53	.157	.165	.270	.240	.34	20.30	2.50
Apr.	20.60	24.90	7.50	20.00	14.60	4.35*	.53	.140	.165	.281	.230	.38	20.30	---
May	20.40	24.50	7.00	20.70	14.60	4.10	.53	.142	.165	.276	.240	.38	20.50	---
June	19.80	23.50	6.50	21.00	15.30	4.25	.53	.142	.160	.267	.220	.38	-- --	---
July	19.00	22.50	6.50	18.50	16.00	4.30	.53	.151	.170	.256	.220	.38	-- --	---
Aug.	17.70	20.90	6.50	16.70	16.30	4.30**	.53	.136	.160	.282	.220	.36	22.60	2.75

SOURCE: *Prices Received by Farmers*, Agricultural Marketing Service, U.S.D.A., Oklahoma City, Oklahoma, Monthly Releases or *Agricultural Prices*, A.M.S., U.S.D.A., Washington, D. C.

[1] Annual prices for crops are season average prices for the crop year weighted by marketings. Annual prices for livestock and products are season average prices for the calendar year weighted by marketings.

* Revised ** Preliminary

Table 2.—Index Numbers of Prices Received by Farmers for Oklahoma Farm Products.[1]

(Percent of 1910-14 Average)

		Wheat	Corn	Oats	Barley	Rye	Grain sorghums	All Hay	Cotton-lint	Cotton-seed	Sweet Potatoes
1958		215	180	135	128	109	143	183	228	247	229***
1959		208	175	143	136	109	142	192	248	207	200***
	Aug.	201	185	143	129	101	140	177	265	210	211
	Sept.	205	162	143	130	110	121	189	274	194	203
	Oct.	210	162	150	132	114	123	206	265	189	179
	Nov.	212	162	152	135	110	125	206	247	194	187
	Dec.	212	162	154	137	109	126	229	236	194	179
1960	Jan.	212	169	161	139	113	130	229	239	194	203
	Feb.	217	174	161	139	116	131	241	234	194	203
	Mar.	223	174	161	139	115	132	282	236	194	203
	Apr.	222	182	157	137	114	134	266	221	194	---
	May	210	178	154	130	113	131	218	251	194	---
	June	195	182	139	120	103	130	200	265	194	---
	July	196	182	139	115	101	131	206	265	194	---
	Aug.	200	183	145	120	102	124	211	265	194	223

		Cattle	Calves	Sheep	Lambs	Hogs	Wholesale milk	Butterfat	All chickens	Eggs	Wool
1958		445	423	169	358	281	242	223	176	185	180
1959		460	458	150	322	203	238	226	142	155	191
	Aug.	468	461	141	337	197	228	222	135	144	215
	Sept.	458	452	141	320	190	234	226	134	157	204
	Oct.	429	427	147	299	176	247	235	130	167	198
	Nov.	398	405	141	293	173	247	239	127	176	198
	Dec.	383	385	143	281	165	249	235	136	182	198
1960	Jan.	395	389	145	289	165	249	226	153	160	204
	Feb.	408	402	162	301	175	249	226	154	147	198
	Mar.	431	409	173	336	199	252	226	167	152	198
	Apr.	427	417	162	344	207	226*	226	149	158	221
	May	422	410	152	356	207	213	226	151	155	221
	June	410	394	141	361	217	221	226	151	150	221
	July	393	377	141	318	227	223	226	161	144	221
	Aug.	366	350	141	287	232	223**	226	145	158	210

SOURCE: Annual data are averages of months for calendar years and are compiled by Dept. of Ag. Econ., Oklahoma State University, from data supplied by Agricultural Marketing Service, U.S.D.A., Oklahoma City, Oklahoma, and Washington, D. C. For previous years, see Oklahoma Agri. Exp. Sta. Publication P-297, Prices Received by Oklahoma Farmers, 1910-1957.

[1] For the index of purchasing power of a unit of an individual commodity in terms of commodities used in farm production and family living, interest, taxes and wage rates, divide the index of price received by Oklahoma farmers (in this table) by the index prices paid by United States farmers in Table 4 for the same month and multiply by 100.

* Revised ** Data not available *** 9 months average

Table 3.—Price Indexes of Groups of Oklahoma Farm Products.
(Percent of 1910-14 Average)

		All farm products	All crops	Feed grains	Feed grains and hay	Cotton and cottonseed	Oil bearing crops	All livestock & L.S. Prod.	Meat animals	Dairy products	Poultry and poultry prod.
1958		271	220	159	172	230	283	327	401	256	187
1959		267	219	158	174	243	262	320	400	254	157
	Aug.	266	218	162	172	258	265	319	404	247	146
	Sept.	266	221	146	166	264	256	314	395	251	156
	Oct.	262	222	148	168	256	245	305	370	263	162
	Nov.	255	220	150	174	240	247	293	347	264	170
	Dec.	251	219	150	182	230	247	286	333	265	178
1960	Jan.	252	220	156	187	233	238	288	341	263	164
	Feb.	256	222	159	193	229	238	293	353	261	153
	Mar.	265	228	159	207	230	238	306	373	263	160
	Apr.	262	224	162	203	217	238	303*	374	247*	160
	May	259	221	159	184	244	247	300	370	240	159
	June	252	213	156	176	256	238	295	362	245	155
	July	249	214	156	179	256	238	288	351	246	152
	Aug.	245	216	156	180	256	238	277	331	246**	159

Purchasing Power Indexes of Groups of Oklahoma Farm Products.[1]
(Percent of 1910-14 Average)

		All farm products	All crops	Food grains	Feed grains	Feed grains and hay	Cotton and cottonseed	Oil bearing crops	All livestock & L.S. prod.	Meat animals	Dairy products	Pltry. and pltry. prod.
1958		92	75	73	54	59	78	96	111	137	87	64
1959		90	74	70	53	59	82	88	107	134	86	53
	Aug.	90	73	67	55	58	87	89	107	136	83	49
	Sept.	90	74	69	49	56	89	86	106	133	85	53
	Oct.	89	75	71	50	57	86	83	103	125	89	55
	Nov.	86	74	71	51	59	81	83	99	117	89	57
	Dec.	85	74	71	51	61	77	83	96	112	89	60
1960	Jan.	84	74	71	52	63	78	80	96	114	88	55
	Feb.	86	74	73	53	65	77	80	98	118	87	51
	Mar.	88	76	74	53	69	77	79	102	124	88	53
	Apr.	87	74	74	54	67	72	79	100*	124	82*	53
	May	86	73	70	53	61	81	82	100	123	80	53
	June	84	71	65	52	59	86	80	99	121	82	52
	July	84	72	66	52	60	86	80	97	118	83	51
	Aug.	82	72	67	52	60	86	80	93	111	83**	53

SOURCE: Compiled by Dept. of Ag. Econ., Oklahoma State University, from data supplied by Agricultural Marketing Service, U.S.D.A., Oklahoma City, Oklahoma, and Washington, D. C. For previous years, see Oklahoma Agri. Exp. Sta. Publication P-297, Prices Received by Oklahoma Farmers, 1910-1957.

[1] The ratio of prices received by farmers to prices paid by farmers for commodities used in farm living and production, interest, taxes and wage rates. For individual commodities, see footnote 1 of Table 2.

* Revised. ** Preliminary.

Table 4.—Index Numbers in the United States, Index of Demand Deposits in Oklahoma, and Oklahoma Price Ratios.

		United States index numbers of:					Oklahoma price ratios[4]			
		Prices received by farmers (1910-14 = 100)	Prices paid by farmers (1910-14=100)	Wholesale prices (1910-14=100)	Industrial manufacturing payrolls[1] (1947-49=100)	Index of demand deposits in Oklahoma[2 3] (1923-25=100)	Hog corn	Egg feed	Turkey feed	Milk feed
1955		232	276	249	152.9	291.3	11.4	9.5	7.4	1.622
1956		230	278	256	161.4	297.4	10.4	9.7	7.2	1.695
1957		235	286	264	162.7	290.9	13.6	9.2	6.7	1.757
1958		250	293	268	148.7	313.0	16.9	10.2	6.9	1.968
1959		240	298	268	167.0	334.5	12.6	8.7	6.9	1.877
	Aug.	239	297	267	164.9	332.8	11.4	8.1	6.6	1.827
	Sept.	240*	297	270	169.1	331.8	12.6	9.1	6.8	1.951
	Oct.	235	296	267	165.9	330.7	11.4	9.6	6.8	2.017
	Nov.	231*	297	267	166.8	339.4	11.6	10.1	7.7	1.971
	Dec.	230*	297	267	175.4	329.2	11.0	10.5	8.7	1.976
1960	Jan.	232	299	267	175.5	335.4*	10.5	9.1	7.6	1.925
	Feb.	233	299	267	173.9*	323.1*	10.9	8.2	7.6	1.912
	Mar.	241*	300	270	172.6*	319.1*	12.4	8.5	7.6	1.928
	Apr.	242	302	270	168.8	318.8	12.4	8.8	7.2	1.694*
	May	241	301	270	171.5	293.6	12.6	8.8	7.7	1.661
	June	236	299	270	172.5	321.4	13.0	8.7	7.2	1.765
	July	238	298	270	169.2**	334.7	13.6	8.4	7.2	1.808
	Aug.	234	298	267	----	----	13.7	9.2	7.2	1.772**

SOURCE: Indexes of U. S. prices received and prices paid by farmers and indexes of U. S. wholesale prices, from *Agricultural Prices*, A.M.S., U.S.D.A., Washington, D. C. Indexes of demand deposits in Oklahoma, calculated by Dept. Agri. Econ., Okla. Agri. Exp. Sta. from data furnished by Federal Reserve Board, Washington, D. C. Indexes of industrial manufacturing payrolls, from U. S. Department of Labor, Bureau of Labor Statistics, Washington, D. C.

[1] Unadjusted for seasonal variation.

[2] Demand deposits of Oklahoma member banks of the Federal Reserve System located in places under 15,000 population.

[3] Index numbers based on net demand deposits prior to 1936 and upon gross demand deposits since that date. For a discussion of this index see CURRENT FARM ECONOMICS, Oklahoma Agricultural Experiment Station Series 49, Vol. 13, Nos. 1 and 2. Feb.-Apr., 1940. p. 41.

[4] The number of bushels of corn or pounds of feed which one unit of the commodity (100 pounds of hogs, one dozen eggs, one pound of turkeys or milk) will purchase. Prices used are the official A.M.S. estimates of prices received by Oklahoma farmers except for commercial feeds or ingredients which are official A.M.S. estimates of prices paid by Oklahoma farmers. These ratios are computed on the basis of fixed rations and are not directly comparable with ratios computed from other rations. The composition of each ration used is available upon request.

* Revised. ** Preliminary.

9-60/3½M